ABSTRACT OF THE DISCLOSURE

Systems and techniques to implement augmented virtual environments. In one implementation, the technique includes: generating a three dimensional (3D) model of an environment from range sensor information representing a height field for the environment, tracking orientation information of image sensors in the environment with respect to the 3D model in real-time, projecting real-time video from the image sensors onto the 3D model based on the tracked orientation information, and visualizing the 3D model with the projected real-time video. Generating the 3D model can involve parametric fitting of geometric primitives to the range sensor information. The technique can also include: identifying in real time a region in motion with respect to a background image in real-time video, the background image being a single distribution background dynamically modeled from a time average of the real-time video, and placing a surface that corresponds to the moving region in the 3D model.

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